Supplementary table A. Relevant dietary studies in autoimmune disease

Disease	Study Design	Randomization	Blinding	Patients (n)	Duration	Dietary Intervention	Result	Notes	Reference
UC	Prospective	No	Open label	191		Low sulfur diet	Consumption of meat (odds ratio (OR) 3.2 (95% CI 1.3–7.8)), particularly red and processed meat (OR 5.19 (95% CI 2.1–12.9)), protein (OR 3.00 (95% CI 1.25–7.19)), and alcohol (OR 2.71 (95% CI 1.1–6.67)) in the top tertile of intake increased the likelihood of relapse compared with the bottom tertile of intake. High sulfur (OR 2.76 (95% CI 1.19–6.4)) or sulfate (OR 2.6 (95% CI 1.08–6.3)) intakes were also associated with relapse		Jowet et al Gut 2004
UC/CD (pediatric)	Prospective	No	Open label	16	52 weeks	Complex carbohydrates diet	Clinical and mucosal improvements were seen in children with CD, who used specific carbohydrate diet (SCD) for 12 and 52 weeks. Harvey-Bradshaw index significantly decreased from 3.3 ± 2.0 to 0.6 ± 1.3 (P = 0.007) as did Pediatric Crohn's Disease Activity Index (21.1 ± 5.9 to 7.8 ± 7.1, P = 0.011). Lewis Score declined significantly from 2153 ± 732 to 960 ± 433 (P = 0.012). Seven patients continued the SCD up to 52 weeks; HB (0.1 ± 0.4) and PCDAI (5.4 ± 5.5) remained improved (P = 0.016 and 0.027 compared to baseline), with mean LS at 1046 ± 372 and 2 patients showed sustained mucosal healing.	Pediatric population	Cohen et al J Pediatr Gastroenterol Nutr. 2014
CD (pediatric)	Retrospective	No	Open-label	7	5 to 30 months	Complex carbohydrates diet	All symptoms were resolved at a routine clinic visit 3 months after initiating the diet. Patient's laboratory indices (serum albumin, C-reactive protein, hematocrit, and stool	Chart review. Exact time of symptom resolution	Suskind et al J Pediatr Gastroenterol Nutr. 2014

							calprotectin) normalized or significantly improved during follow-up clinic visits.	could not be determined.	
RA	Prospective	No	Open-label	130	6 weeks	Mediterranean Diet	Significant benefit in intervention group: patient global assessment at 6 months (p=0.002), pain score at 3 and 6 months (0.011, 0.049), early morning stiffness at 6 months (p=0.041) and Health Assessment Questionnaire score at 3 months (p=0.03).	Females only.	McKellar et al Annals Rheum Dis 2007
RA	Prospective	Yes	Open-label	n=26 n=25 control diet	12 weeks	Mediterranean Diet	Subjects on Mediterranean diet showed significant decreases in DAS28 of 0.56 (p<0.001), HAQ of 0.15 (p=0.020) , and 2 dimensions of SF-36 Health Survey compared to subjects on control diet.	Differences notable in 2nd half of trial	Skoldstam et al Annals Rheum Dis 2003
RA	Prospective	No	n/a	83245 (NHS) + 91393 (NHS II)	NHS: 28 years; NHS II: 18 years	Mediterranean Diet	Adherence to Mediterranean diet not significantly associated with altered risk of RA. Pooled HR for subjects in the highest quartile of the aMed score was 0.98 (95% confidence interval 0.80–1.20) compared with those in the bottom quartile.	Females only	Hu et al Arthritis Care Res 2015
RA	Prospective	Yes	Open-label	n=26 n=25 control diet	12 weeks	Mediterranean Diet	Lower ratio of n-6 to n-3 fatty acids was observed in the Mediterranean diet group. Patients in the Mediterranean diet group with moderate or better clinical improvement during the study had a higher reported intake of n-3 fatty acids and a lower ratio of n-6 to n-3 fatty acids compared to the patients with minor or no improvement	15 responders to Mediterranean diet, 11 non-responders	Hagfors et al Nutr Metab 2005

RA	Prospective	Yes	Open-label	n=26 n=25 control diet	12 weeks	Mediterranean Diet	MD group had significantly higher intake frequencies of antioxidant-rich foods, and also higher intakes of vitamin C (p = 0.014), vitamin E (p = 0.007) and selenium (p = 0.004), and a lower intake of retinol (p = 0.049), compared to the CD group. The levels of retinol, vitamin C and uric acid were negatively correlated to disease activity variables.		Hagfors et al Nutr J 2003
RA	Dose-response Meta-analysis	No	n/a	Various	Various	Fish consumption	Non-statistically significant inverse association between fish consumption and RA. For each serving per week increment in fish consumption, RR of RA was 0.96 (95% CI 0.91 to 1.01)		Di Giuseppe et al Arthritis Res & Therapy 2014
RA	Meta-analysis	No	Placebo-controlled	Various	Various	Fish oil consumption in established RA	Improvement in Clinical Symptoms and Function. 3 months of fish oil significantly reduced tender joint count (rate difference [RD] [95% CI] = -2.9 [-3.8 to -2.1] [p = 0.001]) and morning stiffness (RD [95% CI] = -25.9 [-44.3 to -7.5] [p < 0.01]) as compared with heterogeneous dietary control oils.		Fortin et al J Clin Epidemiol 1995
RA	Prospective	Yes	Controlled	n=75 fish oil n=53 control oil	52 weeks	Fish oil as adjuvant to DMARD therapy in early RA	Fish oil was associated with additional benefits beyond those achieved by combination 'treat-to-target' DMARDs with similar MTX use. Failure of triple DMARD therapy was lower (HR=0.28 (95% CI 0.12 to 0.63; p=0.002) unadjusted and 0.24 (95% CI 0.10 to 0.54; p=0.0006) following adjustment for smoking history, shared epitope and baseline anti–cyclic citrullinated peptide. The rate of first ACR remission was significantly greater in the fish oil compared with the control group (HRs=2.17 (95% CI 1.07 to 4.42; p=0.03)		Proudman et al Annals of Rheum Dis 2015

							unadjusted and 2.09 (95% CI 1.02 to 4.30; p=0.04) adjusted).		
RA	Prospective nested case-control study	No	Placebo-controlled	n=88 patients n=176 controls	n/a	Red meat intake	Among patients with early arthritis, the level of red meat intake was higher (P = 0.04) and that of vitamin C was lower (P = 0.03) compared with intake among controls. After adjusting for possible dietary confounders, subjects with the highest level of consumption of red meat (OR 1.9, 95% CI 0.9-4.0), meat and meat products combined (OR 2.3, 95% CI 1.1-4.9), and total protein (OR 2.9, 95% CI 1.1-7.5) were at an increased risk for arthritis.		Pattison et al Arthritis and Rheumatism 2004
RA	Prospective- Population-based	No	Controlled	n=76,597 (NHS) + n=93,392 (NHS II) n=1007 RA cases	3,678,104 person-years	healthy diet	Among women aged ≤55 years, better quality diet was associated with lower RA risk (HRQ4 vs Q1: 0.67; 95% CI 0.51 to 0.88; p trend: 0.002), but no significant association was found for women aged >55 years (p interaction: 0.005). When stratifying by serology status, the inverse association among those aged ≤55 years was strongest for seropositive RA (HRQ4 vs Q1: 0.60; 95% CI 0.42 to 0.86; p trend: 0.003).	Female only	Hu et al Annals Rheum Dis 2017
RA	Prospective cohort study	No	Controlled	34,141 (Swedish Mammography Cohort) n=197 incident RA	226,032 person-years	Alcohol consumption	Moderate consumption inversely correlates with RA incidence. Drinking >3 glasses of alcohol per week had a 52% decreased risk of RA compared with those who never drank (relative risk 0.48 (0.24 to 0.98)).	Female only	Di Giuseppe D, BMJ 2012

RA	Dose-response Meta-analysis of Prospective Studies	No		n=195,029 participants n=1878 RA cases	various	Alcohol consumption	Low to moderate alcohol consumption yielded a preventive effect on RA development (RR: 0.86; 95% CI 0.78 to 0.94). Regardless of sex, low to moderate alcohol consumption for a period of at least 10 years was found to have a 17% reduction in RA risk.		Jin Z, Annals Rheum Dis 2014
RA	Prospective Population-based	No	Controlled	n=121,701 (NHS) + n=116,430 (NHS II) n=580 incident RA (NHS) n=323 incident RA (NHSII)	1.90 million person-years 1.78 million person-years	Alcohol consumption	Moderate consumption inversely correlates with RA incidence in women. Compared to no use, the HR for alcohol use of 5.0-9.9 gm/day was 0.78 (95% confidence interval [95% CI] 0.61-1.00). For seropositive RA cases, the association appeared stronger (HR 0.69 [95% CI 0.50-0.95]). In addition, women who drank beer 2-4 times a week had a 31% decreased risk compared to women who never drank beer.	Female only	Lu B., Annals Rheum Dis 2014
PsO	Small Prospective	No	Controlled	n=33 antigliadin (AGA) positive PsO n= 6 antigliadin (AGA) negative PsO	3 months	Gluten-free diet (GFD)	Therapeutic effect of a GFD on psoriasis severity. PASI improvement in AGA positive patients (5·5 ± 4·5 vs 3·6 ± 3·0; p=0.001) vs AGA negative patients (8·9 ± 6·4 vs 10·2 ± 7·9; p=0·465).		Michaelsson G, Br J Dermatol 2000

PsO	Prospective	No	No	n=33	mean follow-up 26 months	Bariatric surgery	Dramatic weight loss improves psoriasis 13 of 33 patients (39.4%) had clinical improvement. Eight (24.2%) patients were not on any psoriasis medication at the latest follow-up (P = .001).		Romero-Talamás H, Surg Obes Relat Dis 2014
PsA	Prospective	Yes	Yes	n=overweight PsA n=69 hypocaloric diet (HD) n=69 free-managed diet (FD)	6 months	Weight-loss	Weight loss predicts achievement of minimal disease activity (MDA) in TNFi treated PsA patients. MDA more often achieved by HD than by FD subjects (HR=1.85, 95% CI 1.019 to 3.345, p=0.043). Regardless of the type of diet, after 6 months of treatment with TNFα blockers, ≥5% of weight loss was a predictor of the achievement of MDA (OR=4.20, 95% CI 1.82 to 9.66, p<0.001).		Di Minno MN, Annals Rheum Dis 2014

Supplementary table B. Probiotic and Prebiotic Studies in Autoimmune disease

Disease	Probiotic/Prebiotic	Study Design	Randomization	Blinding	Patients (n)	Duration	Outcomes	Notes	Reference
CD	L. rhamnosus	Prospective	Open-label	No	n=4	6 months	Significant improvement in clinical activity 1 week after starting Lactobacillus GG, sustained throughout the study period. Median pediatric Crohn's disease activity index scores at 4 weeks were 73% lower than baseline. Improved intestinal permeability.		Gupta et al J Pediatr Gastro Nutr 2000
CD	L. rhamnosus, Bifidobacterium sp	Prospective	Open-label	No	10	9-17 months	Seven patients had improved clinical symptoms following combined probiotic and prebiotic therapy. Both CDAI and IOIBD scores were significantly reduced after therapy (255–136, P = 0.009; 3.5–2.1, P = 0.03, respectively). Six patients had a complete response, one had a partial response, and three were non-responders		Fujimori et al J Gastro Hepatol 2007
CD	L. rhamnosus	Prospective	Yes	Placebo-controlled	11	6 months	No beneficial effect in inducing or maintaining medically-induced remission		Schultz et al BMC Gastro 2004
CD	E. coli Nissle 1917	Prospective	Yes	Placebo-controlled	n=16 E.coli n=12 placebo	12 months	33.3% of subjects in E. coli group had a relapse during the 1 year of treatment compared with 63.6% in placebo group. Of subjects who stopped prednisolone before the relapse, 30% in E. coli group had relapse compared to 70% in placebo group. Results did not reach statistical significance.		Malchow J Clin Gastro 1997
CD	Multiple	Meta-analysis	Yes	Placebo-controlled	Various	Various	No evidence to suggest that probiotics are beneficial for the maintenance of remission in CD. All studies had small number of patients.		Rolfe et al Cochrane Database Syst Rev 2006

UC	VSL #3	Prospective	Yes	Placebo-controlled	n=77 VSL#3 n=70 placebo	12 weeks	At week 6, the percentage of patients with an improvement in UCDAI score that was greater than 50% was significantly higher in the VSL#3 group (25; 32.5%) than the placebo group (7; 10%) (P = .001). At week 12, there were 33 patients given VSL#3 (42.9%) who achieved remission, compared with 11 patients given placebo (15.7%) (P < .001). Significantly more patients given VSL#3 (40; 51.9%) achieved a decrease in their UCDAI that was greater than 3 points, compared with those given placebo (13; 18.6%) (P < .001).		Sood et al Clin Gastro Hepatol 2009
UC	Bifidobacterium, Lactobacillus	Prospective	Yes	Placebo-controlled	n=10 probiotics n=10 placebo	12 weeks	CAI was significantly lower in the probiotic than in the placebo group after treatment (p<0.05). The post-treatment endoscopic activity index score was not significantly reduced in the probiotic group.		Kato et al Aliment Pharmacol Ther 2004
UC	Ciprofloxacin + E. coli Nissle	Prospective	Yes	Placebo-controlled	n=50 probiotics n=50 placebo	7 weeks	No benefit in the use of E. coli Nissle as an add-on treatment to conventional therapies for active UC. Treatment with E. coli Nissle without a previous antibiotic cure resulted in fewer patients reaching clinical remission.		Petersen et al J Crohns Colitis 2014
RA	L. casei	Prospective	Yes	Placebo-controlled	n=22 probiotics n=24 placebo	8 weeks	L. casei 01 supplementation decreased serum high-sensitivity C-reactive protein (hs-CRP) levels, tender and swollen joint counts, global health (GH) score and DAS28 vs placebo (P < 0.05). More patients in the L. casei 01 group had moderate response to the treatment, based on the EULAR criteria, at the end of the study (P < 0.01).		Alipour et al Int J Rheum Dis 2014

RA	L. casei; L. acidophilus; Bifidobacterium bifidum	Prospective	Yes	Placebo-controlled	n=30 probiotics n=30 placebo	8 weeks	Probiotic supplementation resulted in improved DAS-28 (-0.3 ± 0.4 vs. -0.1 ± 0.4, P = 0.01) compared with placebo		Zamani et al Int J Rheum Dis 2016
RA	L. casei	Prospective	Yes	Placebo-controlled	n=15 probiotics n=14 placebo	3 months	Three patients in the probiotic (20%) and one in the placebo group (7%) achieved an ACR20 response (p= 0.33). There was no statistically significant difference between individual components of the ACR20 criteria.		Pineda et al Med Sci Monit 2011
SpA	S. salivarius, B. lactis, L. acidophilus	Prospective	Yes	Placebo-controlled	n=32 probiotics n=31 placebo	16 weeks	No significant differences betwen groups in core domains. The mean BASFI fell from 3.5 ± 2.0 to 2.9 ± 1.9 in the probiotic group and from 3.6 ± 1.9 to 3.1 ± 2.2 in the placebo group (p = 0.839). The mean BASDAI fell from 4.2 ± 2.2 to 3.2 ± 2.1 in the probiotic group and 4.5 ± 2.0 to 3.9 ± 2.2 in the placebo group (p = 0.182). No significant adverse events were recorded in the probiotic-treated group.		Jenks et al Journal of Rheum 2010
PsC	B. infantis	Prospective	Yes	Placebo-controlled	n=22 controls n=22 UC n=48 CFS n=26 psoriasis	6-6 weeks	Improvement in inflammatory markers but not clinical parameters		Groeger et al Gut Microbes 2013